

**What Is Claimed Is:**

1           1. A method of processing multi-protocol label switching (MPLS) packets in a  
2   MPLS device, said method comprising:  
3           receiving a configuration data identifying a group of multi-labeled packets and a  
4   corresponding desired EXP value for a stack entry at a low level for said group of multi-  
5   labeled packets;  
6           receiving a multi-labeled packet containing a data packet and a plurality of stack  
7   entries including a low stack entry at said low level;  
8           determining whether said multi-labeled packet falls in said group;  
9           setting EXP bits of said low stack entry to said corresponding desired value if said  
10   multi-labeled packet falls in said group; and  
11          forwarding said multi-labeled packet containing said desired value in EXP bits in  
12   said low stack entry.

1           2. The method of claim 1, wherein said MPLS device comprises an autonomous  
2   system border router (ASBR) located at an edge of a network managed by a service  
3   provider, wherein said service provider controls service levels in forwarding said multi-  
4   labeled packet further down a path by setting said EXP bits.

1           3. The method of claim 2, wherein said group of multi-labeled packets are  
2   identified by a value in EXP bits of a specific stack entry, wherein said determining  
3   comprises examining said multi-labeled packet as received for said value in EXP bits of

4 said specific stack entry.

1           4. The method of claim 1, wherein said data packet is received in the form of  
2 Internet Protocol (IP).

1           5. A machine readable medium carrying one or more sequences of instructions for  
2 causing a multi-protocol label switching (MPLS) to process packets, wherein execution  
3 of said one or more sequences of instructions by one or more processors contained in said  
4 MPLS device causes said one or more processors to perform the actions of:

5           receiving a configuration data identifying a group of multi-labeled packets and a  
6 corresponding desired EXP value for a stack entry at a low level for said group of multi-  
7 labeled packets;

8           receiving a multi-labeled packet containing a data packet and a plurality of stack  
9 entries including a low stack entry at said low level;

10          determining whether said multi-labeled packet falls in said group;

11          setting EXP bits of said low stack entry to said corresponding desired value if said  
12 multi-labeled packet falls in said group; and

13          forwarding said multi-labeled packet containing said desired value in EXP bits in  
14 said low stack entry.

1           6. The machine readable medium of claim 5, wherein said MPLS device  
2 comprises an autonomous system border router (ASBR) located at an edge of a network

3 managed by a service provider, wherein said service provider controls service levels in  
4 forwarding said multi-labeled packet further down a path by setting said EXP bits.

1 7. The machine readable medium of claim 6, wherein said group of multi-labeled  
2 packets are identified by a value in EXP bits of a specific stack entry, wherein said  
3 determining comprises examining said multi-labeled packet as received for said value in  
4 EXP bits of said specific stack entry.

1 8. The machine readable medium of claim 5, wherein said data packet is received  
2 in the form of Internet Protocol (IP).

1 9. A MPLS (multi-protocol label switching) device processing MPLS packets,  
2 said MPLS device comprising:

3 a memory storing a configuration data identifying a group of multi-labeled packets  
4 and a corresponding desired EXP value for a stack entry at a low level for said group of  
5 multi-labeled packets;

6 an inbound interface receiving a multi-labeled packet containing a data packet and  
7 a plurality of stack entries including a low stack entry at said low level;

8 a label processing block determining whether said multi-labeled packet falls in said  
9 group and setting EXP bits of said low stack entry to said corresponding desired value if  
10 said multi-labeled packet falls in said group; and

11 an outbound interface forwarding said multi-labeled packet containing said desired

12 value in EXP bits in said low stack entry.

1 10. The MPLS device of claim 9, wherein said MPLS device comprises an  
2 autonomous system border router (ASBR) located at an edge of a network managed by  
3 a service provider, wherein said service provider controls service levels in forwarding  
4 said multi-labeled packet further down a path by setting said EXP bits.

1 11. The MPLS device of claim 10, wherein said group of multi-labeled packets  
2 are identified by a value in EXP bits of a specific stack entry, wherein said label  
3 processing block examines said multi-labeled packet as received for said value in EXP  
4 bits of said specific stack entry.

1 12. The MPLS device of claim 9, wherein said data packet is received in the form  
2 of Internet Protocol (IP).

1 13. A MPLS (multi-protocol label switching) device processing MPLS packets,  
2 said MPLS device comprising:

3 means for receiving a configuration data identifying a group of multi-labeled  
4 packets and a corresponding desired EXP value for a stack entry at a low level for said  
5 group of multi-labeled packets;

6 means for receiving a multi-labeled packet containing a data packet and a plurality  
7 of stack entries including a low stack entry at said low level;

8           means for determining whether said multi-labeled packet falls in said group;  
9           means for setting EXP bits of said low stack entry to said corresponding desired  
10          value if said multi-labeled packet falls in said group; and  
11          means for forwarding said multi-labeled packet containing said desired value in  
12          EXP bits in said low stack entry.

1           14. The MPLS device of claim 13, wherein said MPLS device comprises an  
2          autonomous system border router (ASBR) located at an edge of a network managed by  
3          a service provider, wherein said service provider controls service levels in forwarding  
4          said multi-labeled packet further down a path by setting said EXP bits.

1           15. The MPLS device of claim 14, wherein said group of multi-labeled packets  
2          are identified by a value in EXP bits of a specific stack entry, wherein said means for  
3          determining examines said multi-labeled packet as received for said value in EXP bits of  
4          said specific stack entry.

1           16. The MPLS device of claim 13, wherein said data packet is received in the  
2          form of Internet Protocol (IP).

1           17. A provider network containing:  
2            a MPLS (multi-protocol label switching) device processing MPLS packets, said  
3          MPLS device comprising:

a memory storing a configuration data identifying a group of multi-labeled packets and a corresponding desired EXP value for a stack entry at a low level for said group of multi-labeled packets;

an inbound interface receiving a multi-labeled packet containing a data packet and a plurality of stack entries including a low stack entry at said low level;

a label processing block determining whether said multi-labeled packet falls in said group and setting EXP bits of said low stack entry to said corresponding desired value if said multi-labeled packet falls in said group; and

an outbound interface forwarding said multi-labeled packet containing said desired value in EXP bits in said low stack entry.

18. The provider network of claim 17, further comprising an edge device  
ing said multi-labeled packet from a private network and forwarding said multi-  
d packet to said MPLS device.

19. The provider network of claim 18, wherein said MPLS device comprises an autonomous system border router (ASBR) located at an edge of a network managed by a service provider, wherein a service provider controls service levels in forwarding said labeled packet further down a path by setting said EXP bits.

20. The provider network of claim 19, wherein said group of multi-labeled packets is identified by a value in EXP bits of a specific stack entry, wherein said label

3 processing block examines said multi-labeled packet as received for said value in EXP  
4 bits of said specific stack entry.

1 21. The MPLS device of claim 19, wherein said data packet is received in the  
2 form of Internet Protocol (IP).

1 22. The provider network of claim 19, further comprising a plurality of core  
2 devices to forward said multi-labeled packet from said edge device to said ASBR.